

Impact of AI-Based Educational Practices on Student Motivation in English Language Learning

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Executive Summary

Objective	Explore whether learning MT literacy will motivate EFL learners to continue learning English even as AI develops.
Method	<ul style="list-style-type: none">• Subjects: 3rd and 4th year university students majoring in English• Surveys were conducted in the 1st and 14th classes in “Machine Translation and AI” course in the 2023 fall semester.
Results & Discussion	<ul style="list-style-type: none">• Learning MT literacy doesn’t reduce students’ motivation to learn English, but further enhances WCE of some motivated students (not their English level).• Incorporating MT pre- and post-editing and effective prompt writing with ChatGPT into the teaching may increase students’ WCE and motivation to learn English.

Outline

- Background
- Literature Review
- Objective
- Method
- Results & Discussion

Background

Recent rapid development of machine translation (MT)

- Increased access to high quality translations for everyone with free.

Controversy over the use of MT in higher education

- Instructors are concerned about promoting passive learning and undermining academic integrity (Tasmedir et al., 2023)
- Most students continue to use MT even when there are explicit prohibit policies (Clifford et al., 2013)

Lack of the opportunities for students to learn about effective use of MT, including strengths and weaknesses.

Literature Review

Positive views on fostering MT literacy

- O'Neill (2016) compared three groups (1) writing with MT with MT training, (2) writing with MT without MT training, and (3) writing without MT with MT training and found that group (1) scored higher in writing than the other groups.
- Bowker (2020) emphasized that MT literacy, as a new subset of digital literacy skills, is necessary to become an informed and critical user of MT tools.

There is growing interest in research on learning MT literacy (deciding whether, when, and why to use this technology).

Literature Review

Impact of the advancement of MT on EFL learners' willingness to learn English: Does MT discourage EFL learners from learning English?

- Oda (2022) reported that in a survey of university students, 57.2% were willing to learn English even with MT.
- Yokono (2023) found that 88% of students preparing to study abroad agreed with the question, "I want to learn English even if AI translation is developed," while 37.5% of students who are not majoring in English agreed, indicating that their responses varied depending on their motivation.

It is important to examine the impact of learning MT literacy on EFL learners' WCE.

Objective

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Explore whether learning MT literacy will motivate EFL learners to continue learning English even as AI develops.

Research Questions

RQ.1. How has learning MT literacy changed EFL learners' motivation to learn English?

RQ.2. What components of MT literacy learning have contributed to students' motivation to learn English and their willingness to continue learning English even as AI develops?

RQ.3. How do students perceive MT literacy learning?

Method

Subjects

- 3rd and 4th year university students majoring in English

Method

- Surveys were conducted in the 1st and 14th classes in “Machine Translation and AI” course conducted in the 2023 fall semester.
- Data from 46 students who had completed the pre- and post-course surveys and had no missing data were used in the analysis.

Method

Survey items (All items used a 6 point Likert scale)

- Intrinsic/extrinsic motivation for learning English (20 items) *
 - Intrinsic motivation (4 items) , Identified Regulation (4 items), Introjected Regulation (4 items), External Regulation (4 items), Amotivation (4 items)
- Willingness to continue to learn English even as AI develops (1 item) *
 - "Do you think you will continue learning English even as MT and AI develop?"
- Level of usefulness of content covered in the classes (9 items)
- Things students were able to do in the classes (6 items)
- Class satisfaction

*Same items for both pre- and post- surveys

Overview

Survey items

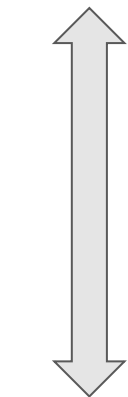
Willingness to continue learning English even as AI develops (WCE)

Motivation to learn English

High autonomy

Intrinsic

Intrinsic motivation



Identified Regulation

Extrinsic

Introjected Regulation

External Regulation

Low autonomy

Unmotivated

Amotivation

(Ryan & Deci, 2002)

“Machine Translation and AI” course
(includes 14 classes)

1st class

14th class

Students

Students



1st survey (pre)



2nd survey (post)¹⁰

Method

Syllabus for the “Machine Translation and AI” course

Week	Topics	Learning Activities & Contents
Week1	Orientation	Introduction, 1st survey (pre)
Week2	Various MT and their characteristics	Awareness of various MT tools and differences in their translation results
Week3	Strengths and weaknesses of MT	Basic structure of language, mistranslation patterns in MT
Week4	History of MT	Rule-based machine translation, statistical machine translation, neural machine translation
Week5	Reading	Pre- & post-editing for English translation
Week6	Writing	Pre- & post- editing for English translation
Week7	Writing	Pre- & post- editing for English translation

Method

Syllabus for the “Machine Translation and AI” course

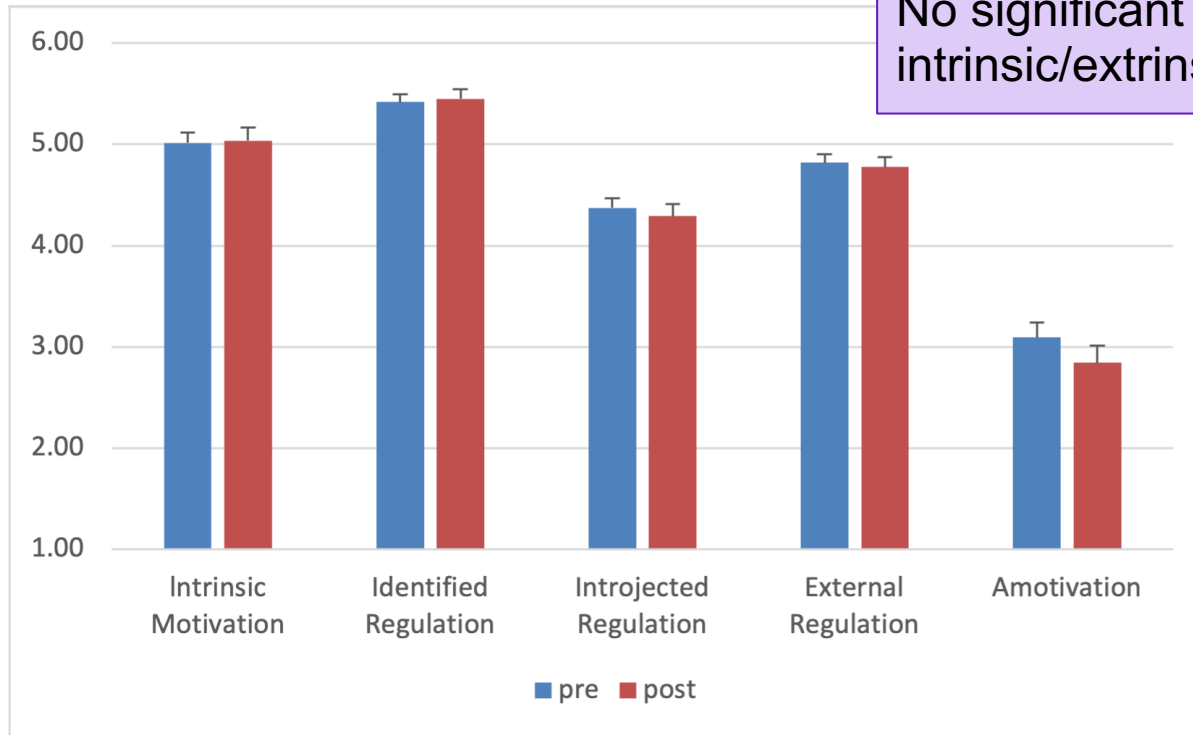
Week	Topics	Learning Activities
Week8	Reading & Writing	Rules for using machine translation, ethical considerations when using MT.
Week9	Creating MT using Google Colaboratory	Creating MT using Google Colaboratory
Week10	ChatGPT definition and features	How ChatGPT works, creating a ChatGPT account, exploring ChatGPT
Week11	Prompts for language learning	Application of ChatGPT to English learning.
Week12	Prompt engineering for language learning	How to create effective prompts to use ChatGPT for English learning.
Week13	Reflection	
Week14	Summary	2nd survey (post)

Results & Discussion

RQ.1. How has learning MT literacy changed EFL learners' motivation to learn English?

Pre and post changes in motivation to learn English

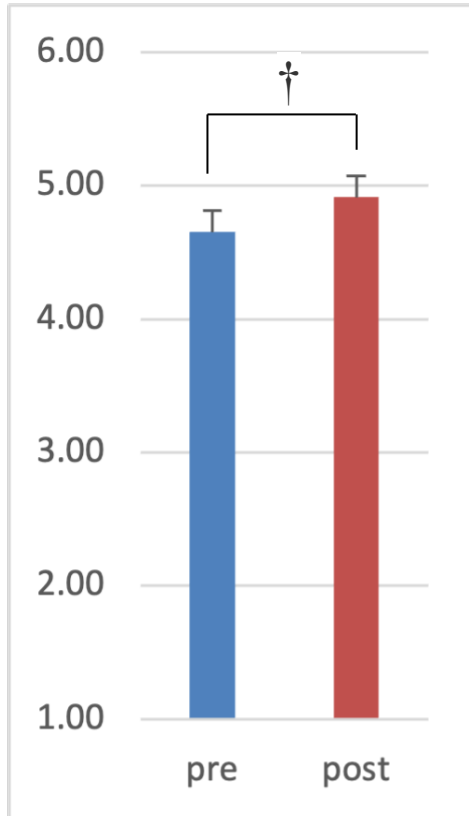
T-test results (N= 46)



No significant differences in intrinsic/extrinsic motivation

Willingness to continue learning English even as AI develops (WCE)

T-test results ($N= 46$)



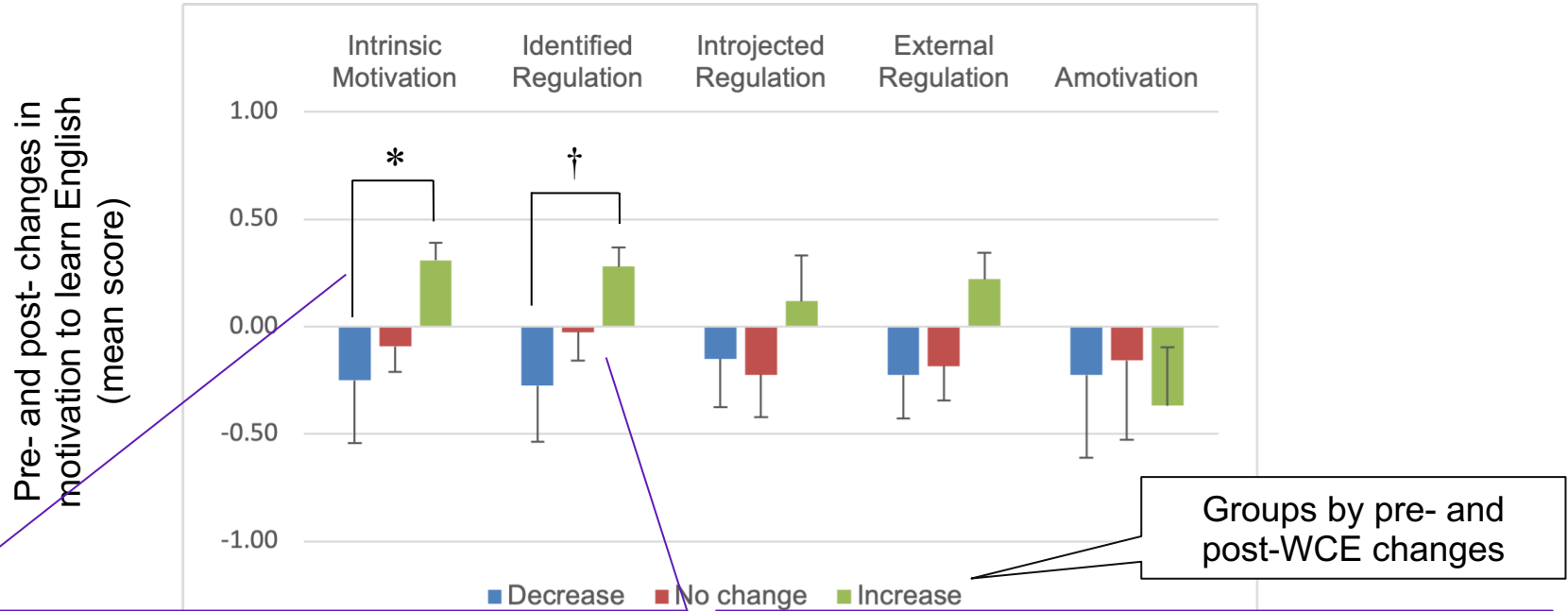
The post mean score of WCE showed a positive trend compared to the pre mean score.
($t(45) = 1.73, p = .090$)

† $p < .10$

Pre- and post- changes in WCE and in motivation to learn English

Results of One-Way ANOVA

Decrease Group: $N=10$, No change Group: $N=19$, Increase Group: $N=17$



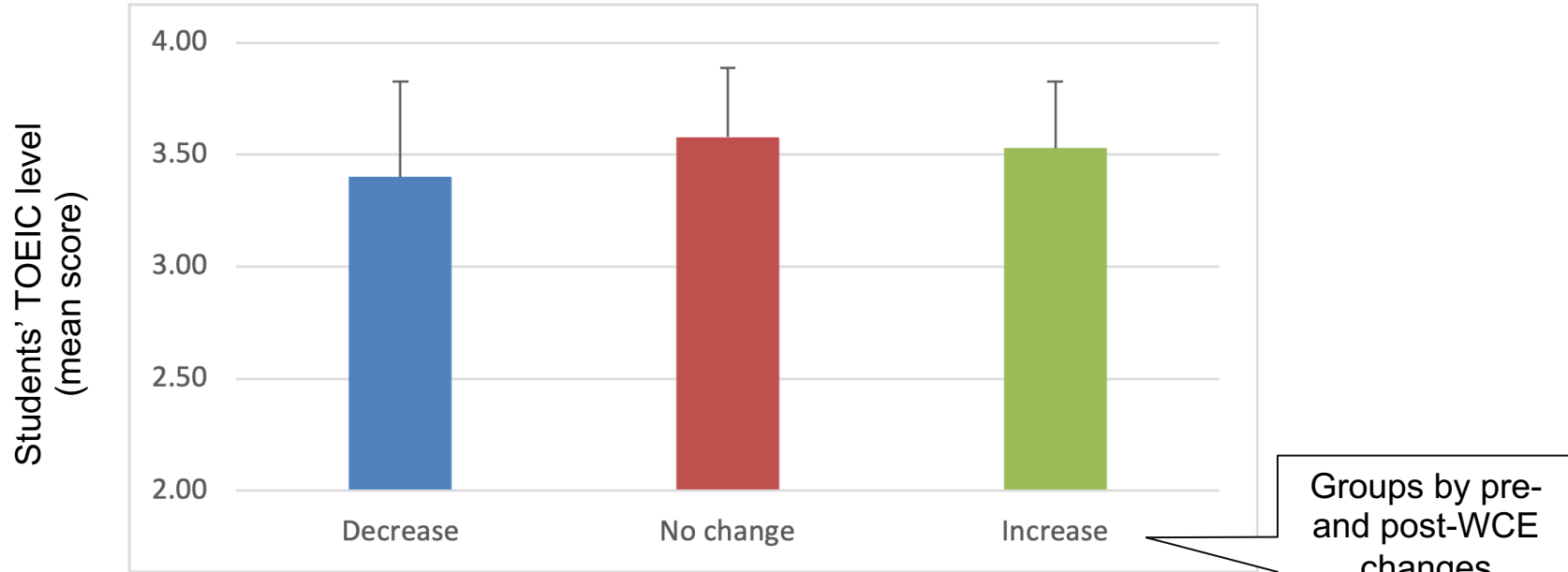
Significant difference between the “decrease” and “increase” WCE groups ($F(2, 43) = 3.61, p = .036$).

Marginally significant difference between the “decrease” and “increase” WCE groups ($F(2, 43) = 3.11, p = .055$).

Pre- and post- changes in WCE by students' TOEIC level

Results of One-Way ANOVA

Decrease Group: $N=10$, No change Group: $N=19$, Increase Group: $N=17$

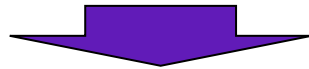


No significant differences among "decrease," "no change," and "increase" WCE groups by TOEIC level

Note. Average TOEIC level is calculated as TOEIC 300 level:1 to TOEIC 800+ level:6

RQ.1. How has learning MT literacy changed EFL learners' motivation to learn English?

- There was no significant difference in motivation to learn English, whereas the post mean score of WCE showed a positive trend compared to the pre mean score.
- Students with increased WCE tended to have increased intrinsic and extrinsic motivation, while students with decreased WCE tended to have decreased intrinsic and extrinsic motivation.
- No significant relationship was found among "decrease," "no change," and "increase" WCE groups by TOEIC level.



Learning MT literacy doesn't reduce students' motivation to learn English, but further enhances WCE of some motivated students (not their English level).

Results & Discussion

RQ.2. What components of MT literacy learning have contributed to students' motivation to learn English and their WCE?

Perceived usefulness for learning English by learning topics

Percentage (N=46)

MT

0% 20% 40% 60% 80% 100%

Characteristics by MT (different machine translations produce different translation results)

Strengths and limitations of MT (mistranslations and unnatural translations)

History of MT (e.g. rule-based machine translation, statistical machine translation, neural machine translation, etc.)

Data-driven MT systems (translation by probability calculation based on huge amount of data)

Pre- and post-editing

Creating MT using Google Colaboratory

ChatGPT definition and features

Prompts for language learning

Prompt engineering for language learning

1 Strongly disagree 2 3 4 5 6 Strongly agree

ChatGPT

Students found it useful to learn about the characteristics, strengths, and limitations of MT, pre- and post-editing, and ChatGPT for learning English.

MT literacy self-evaluation

Percentage (N=46)

MT

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Understand the strengths and limitations of MT.

Be able to perform pre- and post-editing to produce higher quality translations.

Can apply MT to English learning based on its strengths and limitations.

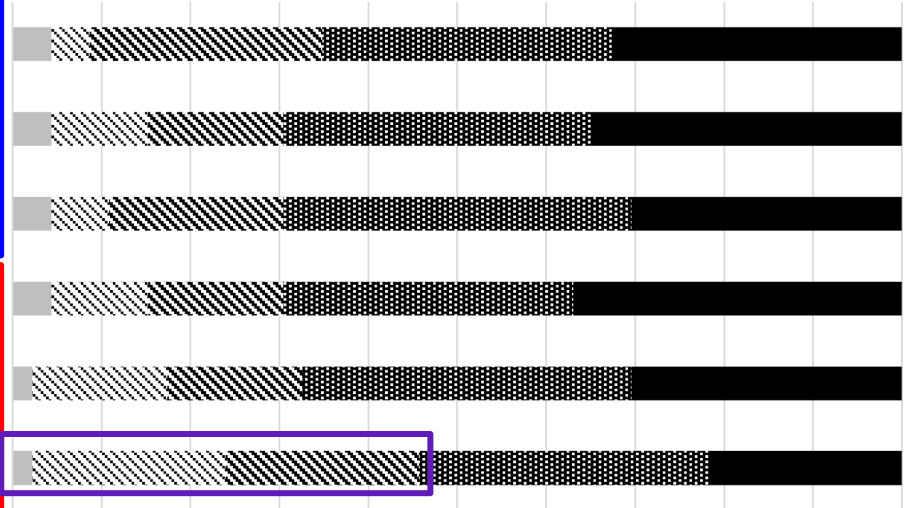
Understand the strengths and limitations of ChatGPT

Can apply ChatGPT to English learning based on its strengths and limitations.

Can write effective prompts for English learning.

ChatGPT

1 Strongly disagree 2 3 4 5 6 Strongly agree



Classroom learning alone was not enough to develop enough confidence to write effective prompts for learning English

Relationship between MT literacy self-evaluation and WCE & intrinsic motivation

Results of Multiple Regression Analysis (N=46)

		Pre and post changes in WCE Intrinsic motivation (post)					
		β	t	Sig.	β	t	Sig.
(Constant)	The pre- and post editing ability is <u>positively correlated</u> to changes in WCE		0.333	0.741		6.043	0.000
	Understand the strengths and limitations of MT	-0.492	-1.609	0.116	-0.213	-0.746	0.460
	<u>Be able to perform pre- and post-editing to produce higher quality translations</u>	0.873	2.923	0.006**	0.297	1.066	0.293
	Can apply MT to English learning based on its strengths and limitations.	-0.365	-1.083	0.285	0.429	1.365	0.180
	Understand the strengths and limitations of ChatGPT	0.089	0.340	0.736	-0.252	-1.025	0.312
	Can apply ChatGPT to English learning based on its strengths and limitations	-0.071	-0.236	0.814	-0.251	-0.892	0.378
	<u>Can write effective prompts for English learning.</u>	0.035	0.145	0.886	0.382	1.705	0.096†
Adjusted R Square		ChatGPT					
		Effective prompt creation by chat GPT has a <u>positive correlation trend</u> with intrinsic motivation					

** $p < .01$, † $p < .10$

RQ.2. What components of MT literacy learning have contributed to students' motivation to learn English and their WCE?

- Students found it useful to learn about the characteristics, strengths, and limitations of MT, pre- and post-editing, and ChatGPT for learning English.
- Students with higher self-evaluations of their ability to perform pre- and post-editing were significantly more motivated by the WCE
- Students with higher self-evaluations of their ability to write effective prompts by ChatGPT showed a higher trend in intrinsic motivation (post).



Incorporating these aspects into the teaching activities may increase students' WCE and motivation to learn English.

Results & Discussion

RQ.3. How do students perceive MT literacy learning?

Excerpts from final reports of enrolled students

Changing perceptions of MT and ChatGPT

“Before taking this class, I felt that using MT in learning English was a bad thing, because it made me feel like I was spoiling myself. However, now that I have completed this class, I realize that using MT is not a bad thing, but rather a big issue for me is how well I can use MT.”

“I had a negative image of MT when it came to language learning. The use of MT for assignments was prohibited in other classes. However, this class taught me that using MT is not evil in itself, but rather it can be used effectively to learn language more efficiently.”

Excerpts from final reports of enrolled students

Changing perceptions of MT and ChatGPT

“I have always resisted using MT for language learning because I felt like I was being lazy. I think this resistance came from the feeling that if I used MT, I wouldn't have to use my own brain. However, through the lecture, I learned that ‘MT only makes suggestions, not acts on my behalf,’ and realized that I had been relying on MT. Ultimately, I learned that MT and other AI tools can either hinder or enhance language skills, depending on the literacy of the person using them. I feel that this change in my perception of MT has had an impact on my language learning.”

Excerpts from final reports of enrolled students

Application to learning

“This class has changed the way I interact with MT. Specifically, I have had more opportunities to edit my translations to make them more accurate, and more time to think about how to be more effective in learning, rather than simply translating. By doing so, I believe I have improved my skills in utilizing the medium more efficiently.”

RQ.3. How do students perceive MT literacy learning?

- Lack of MT literacy may cause students to feel guilty or, conversely, to rely too much on MT and trust the results without a critical perspective.
- Learning how to apply MT literacy and AI to language learning helps students recognize MT and AI tools as being used for language learning



University instructors should incorporate MT literacy into their language instruction.

Future research directions

Conduct interviews to better understand changes in student motivation.

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References

- Bowker, Lynne. “Machine Translation Literacy Instruction for International Business Students and Business English Instructors.” *Journal of Business & Finance Librarianship* 25 (August 3, 2020): 1–19.
- Clifford, Joan, Lisa Merschel, and Joan Munné. “Surveying the Landscape: What Is the Role of Machine Translation in Language Learning?” *@tic Revista d’innovació Educativa (Research and Education and Learning Innovation Archives)*, no. 10 (June 3, 2013): 108–21. <https://doi.org/10.7203/attic.10.2228>.
- O’Neill, Errol M. “Measuring the Impact of Online Translation on FL Writing Scores.” *IALLT Journal of Language Learning Technologies* 46, no. 2 (2016): 1–39. <https://doi.org/10.17161/iallt.v46i2.8560>.
- Oda Toshiko (小田登志子). “機械翻訳時代に学習者が意味を見いだす大学教養英語教育とは。” 東京経済 大学人文自然科学研究会 『人文自然科学論集』 151 (2022): 17–49.
- Tasmedir, Saziye, Elaine Lopez, Müge Satar, and Nick Riches. “Teachers’ Perceptions of Machine Translation as a Pedagogical Tool.” *The JALT CALL Journal* 19 (April 30, 2023): 92–112.
- Yokono Narumi (横野成美). “AI通訳・翻訳の使用が学生の英語学習意欲に与える影響.” 星稜論苑 52 (2023): 15–26.

Thank you!

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